

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. **(Currently Amended)** A process for producing synthetic quartz glass, comprising: feeding oxygen gas, hydrogen gas, and a silica-forming reactant gas from a single burner to a reaction zone, flame hydrolyzing the silica-forming reactant gas in the reaction zone to form fine particles of silica, depositing the silica particles on a rotatable substrate in the reaction zone to form a cylindrical porous silica matrix wherein during formation of the porous silica matrix, the silica matrix and the flame of reactant gas from the single burner are oriented to define an angle of 90° — 110° $100^\circ - 110^\circ$ between their respective center axes so that the entire cylindrical porous silica matrix has a density of $0.1 - 1.0 \text{ g/cm}^3$ with a uniform density defined by a density distribution within 0.1 g/cm^3 , and heating and vitrifying the porous silica matrix in a fluorine compound gas-containing atmosphere to form a fluorine-containing synthetic quartz glass.
2. **(Original)** The process of claim 1 wherein a fluorine compound gas is also fed from the burner to the reaction zone along with the silica-forming reactant gas.
3. **(Previously Presented)** The process of claim 1, further comprising heat treating the fluorine-containing synthetic quartz glass in a hydrogen gas-containing atmosphere.
- 4.–6. **(Canceled)**
7. **(Previously Presented)** A process according to claim 1, wherein the silica-forming reactant gas is silicon tetrachloride or an alkoxysilane.

8. **(Previously Presented)** A process according to claim 7, wherein the alkoxysilane is tetramethoxysilane.
9. **(Previously Presented)** A process according to claim 2, wherein the fluorine compound is SiF_4 , CHF_3 , or CF_4 .
10. **(Previously Presented)** A process according to claim 1, wherein the fluorine compound gas containing atmosphere comprises a fluorine compound gas and an inert gas.
11. **(Previously Presented)** A process according to claim 10, wherein the inert gas is helium or argon.
12. **(Previously Presented)** A process according to claim 3, wherein the hydrogen gas-containing atmosphere comprises helium or argon.
13. **(Previously Presented)** A process according to claim 3, wherein the hydrogen gas-containing atmosphere comprises 1–3% by volume hydrogen.
- 14.–17. **(Canceled)**
18. **(New)** A process according to claim 1, wherein the flame of reactant gas is directed at the tip of the forming cylindrical porous silica matrix.